Application Serial No:10/730,194
In reply to Office Action of 15 November 2004

Attorney Docket No. 84280

REMARKS / ARGUMENTS

Claims 1-5 are currently pending in the application. No claims are allowed. Claims 1-5 are rejected to. Claims 1-3 are amended by this action.

The Office Action has rejected claim 1 under 35 U.S.C. § 102(b) as being anticipated by Lu et al (reference A: U.S. Patent No. 5,804,727).

The Office Action states that Lu et al. teaches a method to estimate a real and imaginary dilatational wavespeed of a material (col. 3, lines 29-44), said method comprising the steps of: providing a specimen of the material (col.4, lines 11-58 and cols. 6-8, lines 34-2); providing a source of acoustic waves at a zero wavenumber (col. 4, lines 11-58 and cols. 6-8, lines 34-2); positioning said specimen at a distance from said source such that said acoustic waves conform to plane waves (col. 4, lines 11-58 and cols. 6-8, lines 34-2); exciting said specimen with said acoustic waves (col. 4, lines 11-58 and cols. 6-8, lines 34-2); measuring transfer function data subsequent said excitation of said specimen (col. 5, lines 18-54 and cols. 6-8, lines 34-2); calculating said transfer function data to closed form (col. 5, lines 18-54 and cols. 6-8, lines 34-2); and determining the real and imaginary dilatational wavespeed of said specimen from said calculated transfer function data (cols. 5-6, lines 55-33 and cols. 6-8, lines 34-2).

The Office Action has rejected claims 2-5 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Lu et al. in view of Zeroug et al. (reference B: U.S. Pub. No. 20040054474).

The Office Action states that Lu et al teach the subject matter discussed above. Lu et al. do not mention explicitly; exciting said specimen for at least two nonzero wavenumbers; measuring transfer function data subsequent to the excitation of said specimen for at least two nonzero wavenumbers; calculating said transfer function data to closed form subsequent to said measuring step said specimen for said excitation for at least two nonzero wavenumbers; determining an estimated real and imaginary shear wavespeed of the material from said transfer function data calculated to closed form subsequent to said measuring step of said specimen for said excitation for at least two nonzero wavenumbers; obtaining a real and imaginary shear modulus of the material from said real and imaginary determined shear wavespeed; determining a real and imaginary Young's modulus of the material from said obtained shear modulus; and obtaining an estimated Poisson's ratio of the material from said determined Young's modulus and said obtained shear modulus.

The Office Action further states that Zeroug et al. teach a method for estimating the time varying mechanical properties of a material, comprising the steps of: exciting a specimen of a material for at least two nonzero wavenumbers (section 0056);

measuring transfer function data subsequent to the excitation of said specimen for at least two nonzero wavenumbers (sections 0056, 0062-0064, 0075-0077, 0080 and 0084-0093); calculating said transfer function data to closed form subsequent to said measuring step said specimen for said excitation for at least two non zero wavenumbers (sections 0056, 0062-0064, 0075-0077, 0080 and 0084-0093); and determining an estimated complex shear wavespeed of the material from said transfer function data calculated to closed form subsequent to said measuring step of said specimen for said excitation for at least two nonzero wavenumbers (sections 0056, 0062-0064, 0075-0077, 0080 and 0084-0093); obtaining a complex shear modulus of the material from said complex determined shear wavespeed (sections 0075-0077); determining a complex Young's modulus of the material from said obtained shear modulus (sections 0023, 0076 and 0114); and obtaining an estimated Poisson's ratio of the material from said determined Young's modulus and said obtained shear modulus (sections 0023, 0076 and 0114).

The Office Action further states that it would have been obvious to one having skill in the art at the time the invention was made to include the teaching of Zeroug et al. in the invention of Lu et al. in order to determine the shear strength and the linear elastic parameters of said material as an important mechanical property from knowledge of the velocity of

propagation of the compressional and shear acoustic waves inside said material (Zeroug et al., section 0003).

Before proceeding further, the Applicant appreciates the courtesies extended by the Examiner during the interview of January 6, 2005. In accordance with the discussions of the interview, the rejections of the Office Action are respectfully traversed in view of the amendment and remarks herein.

In the Office Action, claim 1 of the present application was rejected under 35 U.S.C. § 102(b) as being anticipated by Lu et al (reference A: U.S. Patent No. 5,804,727). In response, claim 1 has been amended to recite the method as measuring and calculating frequency domain transfer function data. These steps of measuring and calculating the frequency domain transfer function are supported by equation 57 of the subject application and reference thereto.

In contrast, the Lu reference is limited to a measuring and calculating method utilizing a timing means, a known separation distance and the setting of a time gate (See claim 1, paragraphs b-d). As such, the cited reference neither teaches nor suggests the measuring and calculating of frequency domain transfer function data. As a result, amended claim 1 of the present application would not be anticipated by the Lu reference and therefore the rejection of the Office Action is traversed.

In the Office Action, claims 2-5 of the present application were rejected under 35 U.S.C. § 103(a) as being unpatentable over Lu et al. in view of Zeroug et al. (reference B: U.S. Pub. No. 20040054474). In response, claim 1 of the present application, upon which claims 2-5 depend, has been amended to recite the method as measuring and calculating frequency domain transfer function data. These steps of measuring and calculating the frequency domain transfer function are supported by equation 57 of the subject application and reference thereto.

In contrast, the Lu reference is limited to a measuring and calculating method utilizing a timing means, a known separation distance and the setting of a time gate (See claim 1, paragraphs b-d). As such, the cited reference neither teaches nor suggests the measuring and calculating of frequency domain transfer function data of amended claim 1. As result, it would not be obvious to one skilled in the art to combine the Lu reference with the Zeroug reference to produce the method of amended claim 1; therefore, claims 2-5 of the present application also would not be obvious to one skilled in the art in view of the cited references and the rejection of the Office Action is traversed.

In further response, amended claim 2, upon which claims 3-5 depend, has been amended to conform to the antecedent basis of amended claim 1 and originally recites "calculating transfer function data to closed form". By calculating to closed form,

the method avoids the use of iterations in calculations. These steps of calculating the transfer function are supported by equation 57 of the subject application and reference thereto.

In contrast, the Zeroung reference is limited to a calculating and processing method using iterations of comparison and updating(See base claim 1, paragraph (v) and dependant claims 4,13). As such, the cited reference neither teaches nor suggests the calculating of transfer function data to closed form, as recited by claim 2 of the present application. As result, it would not be obvious to one skilled in the art to combine the Lu reference with the Zeroug reference to produce the method of amended claim 2; therefore, claims 3-5 also would not be obvious to one skilled in the art in view of the cited references and the rejection of the Office Action is traversed.

In still further response, amended claim 3, upon which claims 4 and 5 depend, has been amended to recite "obtaining a real and imaginary shear modulus using a grid method". By using a grid method, the method avoids the use of iterations in calculations. The obtaining step of amended claim 3 is supported by equation 57 of the subject application and reference thereto.

In contrast, the Zeroung reference is limited to a calculating and processing method using iterations of comparison and updating(See base claim 1, paragraph (v) and dependant

claims 4,13). As such, the cited reference neither teaches nor suggests the obtaining a real and imaginary shear modulus using a grid method, as recited by amended claim 3 of the present application. As result, it would not be obvious to one skilled in the art to combine the Lu reference with the Zeroug reference to produce the method of amended claim 3; therefore, claims 4 and 5 of the present application also would not be obvious to one skilled in the art in view of the cited references and the rejection of the Office Action is traversed.

In views of the remarks above, Applicant respectfully request reconsideration and allowance of the application.

The Examiner is invited to telephone Michael P. Stanley Attorney for Applicant, at 401-832-4736 if, in the opinion of the Examiner, such a telephone call would serve to expedite the prosecution of the subject patent application.

Respectfully submitted,
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By _____
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